

ABSTRACT

The fusion of physiological benefits like health promoting or therapeutic potential in disease prevention with the basic function of supplying nutrients conceptualized the development of functional foods. These foods are capable of combating the prevalence of lifestyle disorders like diabetes and obesity. Jamun (*Syzygium cumini* Linn.), a seasonal perishable berry, grows mainly in tropical and sub-tropical parts of the world. It possesses attractive color, astringent taste, and appreciable mineral and vitamin content. The fractions of the whole fruit, i.e. pulp, skin and seed are well known for therapeutic effectuates and possess the potential to be utilized for functional food development. Confection is a group of sweet and carbohydrate-rich products which primarily includes sugar (sucrose) along with optionally selected chocolate, nuts, fruits, vegetables or gums, with a texture varying from hard to soft delicacies, and exhibits enormous scope of market potential. No report is available for incorporation/utilization of whole jamun into functional food product in the form of a confection. Considering the scope of functional confections, the present study was aimed to develop and characterize whole jamun based functional confection (WJFC). Three stages of optimization using response surface methodology (RSM) with D-optimal mixture design at initial two stages and rotatable central composite design at third stage were applied sequentially. The process involved optimization of hydrocolloid mixture (agar, pectin and polydextrose), followed by optimization of confection formulation where hydrocolloid mixture, jamun pulp and seed powder were variables, and lastly, the optimization of antimicrobial agents (sorbic acid and benzoic acid) to extend the shelf life of the end product. The characterization of WJFC with respect to its physical and thermal properties, chemical composition, sensory and functional properties along with storage studies were carried out.

Optimum formulation for 100 g of WJFC was found to be 2.289 g agar, 1.890 g pectin, 27.236 g polydextrose, 26.585 g jamun pulp and 2.000 g seed powder, along with 0.022 g benzoic acid and 0.086 g sorbic acid (antimicrobial agent), 0.183 g CaCl₂ (firming agent), and 0.06 g citric acid and artificial sweetener (to taste). WJFC featured appealing natural color and flavor of the raw jamun fruit. It was rich in minerals (Ca and Mg) and phenolics with high antioxidant activity. It inhibited α -amylase activity and glucose diffusion, supporting the antidiabetic potency. Moreover, WJFC was low glycemic reduced calorie product having prebiotic effect. Therefore, it can be stated that the confection is a functional food with potential antidiabetic action. The shelf life of WJFC for 15% deterioration in anthocyanins, the most sensitive quality parameter observed, was found to be best before 202 days when packaged in metalized BOPP (36 μ m) and stored at 10 °C, 75% RH.

Key Words: Functional confection, *Syzygium cumini*, antioxidant, antidiabetic, glycemic index, prebiotic effect